AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A process for producing a fibrous material, comprising a lignocellulosic matrix with phenolic groups which are capable of being oxidized by oxidizing agents, and a signalling agent, said process comprising the steps of

– oxidizing phenolic or similar structural groups of the lignocellulosic matrix to provide an oxidized fibre material, and

– contacting the oxidized fibre material with a signalling agent containing at least one first functional site, which is compatible with the oxidized fibre material in order to achieve covalent, ionic or hydrogen bonding of the signalling agent to the lignocellulosic material, said signalling agent being capable of providing the lignocellulosic fibre material with properties foreign to the native fibre, wherein the signalling agent is a compound foreign to the fibre material, and

said signalling agent is selected from the group consisting of Acid Green 41, Alizarin Red S, Alizarin Yellow GG, Bromocresol Purple, Celestine Blue, o-cresolphtalein, Cresol Red, Fluorescein, Gallocyanine, Hematoxylin, 4-methylesculetin, 9-phenyl-2,3,7-trihydroxy-6-fluorone, Plasmocorinth B, Purpurin, Quinalizarin, Thymolphtalein, Tiron, Xylenol Blue and Xylenol Orange.

2. (currently amended): A process for producing a fibrous material, comprising a lignocellulosic matrix with phenolic or similar structural groups which are capable of being oxidized by oxidizing agents, and a signalling agent, said process comprising the steps of

– oxidizing phenolic or similar structural groups of the lignocellulosic matrix to provide an oxidized fibre material, and

– contacting the oxidized fibre material with a modifying agent containing at least one first functional site, which is compatible with the oxidized fibre material, and at least one second functional group in order to provide a lignocellulosic fibre material having a modified surface,

– contacting the thus modified lignocellulosic fibre material with a signalling agent, and

– bonding the signalling to the modified surface of the fibre material in order to impart to the fibre material new functional properties derivable from the signalling agent,

– wherein the signalling agent is a compound foreign to the fibre material and is selected from the group consisting of Acid Green 41, Alizarin Red S, Alizarin Yellow GG, Bromocresol Purple, Celestine Blue, o-cresolphtalein, Cresol Red, Fluorescein, Gallocyanine, Hematoxylin, 4-methylesculetin, 9-phenyl-2,3,7-trihydroxy-6-fluorone, Plasmocorinth B, Purpurin, Quinalizarin, Thymolphtalein, Tiron, Xylenol Blue and Xylenol Orange.

3. (previously presented): The process according to claim 1, wherein the lignocellulosic fibrous matrix is reacted with an oxidizing agent in the presence of a substance capable of catalyzing the oxidation of phenolic or similar structural groups by said oxidizing agent.

4. (previously presented): The process according to any of claim 1, wherein the signalling agent is activated with an oxidizing agent.

5. (previously presented): The process according to any of claim 1, wherein the signalling-agents is selected from security components, metallic particles or chemical security features, and machine-readable pigments.

6. (previously presented): The process according to claim 5, wherein the signalling agents comprise thermochromes, photochromes, and electrically conductive substances comprising electrically conductive polymers, radioactive compounds, fluorescent compounds, luminescent compounds and various inorganic compounds.

7. (previously presented): The process according to claim 1, wherein the signalling agent exhibits at least one functional site, which is compatible with the fibrous matrix or with the modifying agent in order to achieve covalent or physical bonding of the signalling agent to the lignocellulosic material.

8. (original): The process according to claim 7, wherein the functional site comprises reactive groups selected from hydroxy, carboxy, anhydride, aldehyde, ketone, amino, amine, amide, imine, imidine and derivatives and salts thereof.

9. (previously presented): The process according to claim 1, wherein the signalling agent can be detected by visual colour change, laser, magnetics, conductivity, microwaves, ultrasonic, infrared, mass spectrometry, gas chromatography, physical agents, or combinations thereof.

10. (previously presented): The process according to claim 1, wherein the modifying compound is a bifunctional compound containing at least one first functional site and at least one second functional group, the second functional group being selected from the group of hydroxyl (including phenolic hydroxy groups), carboxy, anhydride, aldehyde, ketone, amino, amine, amide, imine, imidine and derivatives and salts thereof.

11. (previously presented): The process according to claim 1, wherein the modifying compound is a bifunctional compound containing at least one first functional site and at least one second functional group, the first functional site being selected from the group consisting of hydroxy, carboxy, anhydride, aldehyde, ketone, amino, amine, amide, imine, imidine and salts thereof.

12. (currently amended): The process according to claim ~~1~~3, wherein the substance capable of catalyzing the oxidation of phenolic or similar structural groups is an enzyme or a chemical agent or a radiation agent.

13. (previously presented): The process according to claim 12, wherein the enzyme capable of catalyzing the oxidation of phenolic or similar structural groups is selected from the group of peroxidases and oxidases.

14. (original): The process according to claim 13, wherein the enzyme is selected the group of laccases (EC 1.10.3.2), catechol oxidases (EC 1.10.3.1), tyrosinases (EC 1.14.18.1), bilirubin oxidases (EC 1.3.3.5), horseradish peroxidase (EC 1.11.1.7), manganase peroxidase (EC 1.11.1.13) and lignin peroxidase (EC 1.11.1.14).

15. (previously presented): The process according to any of claim 14, wherein the enzyme dosage is about 1 to 100,000 nkat/g, and it is employed in an amount of 0.0001 to 10 mg protein/g of dry matter.

16. (previously presented): The process according to claim 12, wherein the chemical agent is selected from the group of per-compounds.

17. (previously presented): The process according to claim 1, wherein the oxidizing agent is selected from the group of oxygen, hydrogen peroxide and oxygen-containing gases air.

18. (previously presented): The process according to claim 1, wherein oxygen or oxygen-containing gas is introduced into the aqueous slurry during the reaction.

19. (previously presented): The process according to claim 1, wherein the reaction of step (a) is carried out in an aqueous or dry phase at a consistency of 1 to 95 % by weight of the fibre material.

20. (previously presented): The process according to claim 1, wherein the reaction is carried out at a temperature in the range of from 5 to 100 °C.

21. (previously presented): The process according to claim 5, wherein the signalling agent is a security component, which is a fluorescent compound verifiable under UV light from scanners.

22. (previously presented): The process of claim 16, wherein the per-compounds are selected from the group consisting of alkali metal persulphates and hydrogen peroxide.

23. (previously presented): The process according to claim 15, wherein the enzyme dosage is about 10-500 nkat/g.

24. (previously presented): The process of claim 19, wherein the reaction of step (a) is carried out in an aqueous or dry phase at a consistency of about 2 to 40 % by weight of the fibre material.

25. (previously presented): The process of claim 17, wherein the oxygen-containing gas is air.